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Attorney Docket No. 0670-0248

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:	) Group Art Unit: 2872
Takayoshi HIRAGA et al.	) Examiner: A. Chang
Serial No. 09/582,230	) <u>CERTIFICATE OF MAILING</u>
Filed: July 21, 2000	) I hereby certify that this correspondence is being
For: OPTICAL PICKUP DEVICE USING	) deposited with the United States Postal Service
HOLOGRAM PATTERN AND	) with sufficient postage as First Class Mail in an
HOLOGRAM PATTERN	) envelope addressed to: Commissioner for Patents,
GENERATING METHOD	) P.O. Box 1450, Alexandria, VA 22313-1450, on
	) <u>12.11.03</u>
	) <u>Adelle M. Stamps</u>

RESPONSE

Honorable Commissioner of Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

Further in response to the final Official Action dated July 30, 2003, and to the Advisory Action dated November 21, 2003, please consider the following remarks in connection with the above-identified application. It is noted that a *Request for Continued Examination* was timely filed on December 1, 2003.

The Applicants note with appreciation the consideration of the Information Disclosure Statements filed on July 12, 2000, and July 8, 2002.

Claims 20-24 are pending in the present application, of which claims 20 and 24 are independent. For the reasons set forth in detail below, all claims are believed to be in condition for allowance. Favorable reconsideration is requested.

Paragraph 1 of the Official Action objects to claim 21. The Advisory Action does not address the Applicants' response at page 4 of the *Amendment* filed October 30, 2003. For the reasons stated in the *Amendment*, the Applicants submit that the specification fully supports and describes the claimed features of the present invention

in a manner which is clear and definite to one of ordinary skill in the art. Therefore, the Applicants request that the objection be reconsidered and withdrawn.

Paragraph 2 of the Official Action rejects claims 20, 22 and 23 as obvious based on the combination of U.S. Patent No. 5,828,643 to Takeda et al. and U.S. Patent No. 5,986,779 to Tanaka et al. The Applicants respectfully traverse the rejection because the Official Action has not made a *prima facie* case of obviousness.

As stated in MPEP §§ 2142-2143.01, to establish a *prima facie* case of obviousness, three basic criteria must be met. First, there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. Obviousness can only be established by combining or modifying the teachings of the prior art to produce the claimed invention where there is some teaching, suggestion, or motivation to do so found either explicitly or implicitly in the references themselves or in the knowledge generally available to one of ordinary skill in the art. "The test for an implicit showing is what the combined teachings, knowledge of one of ordinary skill in the art, and the nature of the problem to be solved as a whole would have suggested to those of ordinary skill in the art." In re Kotzab, 217 F.3d 1365, 1370, 55 USPQ2d 1313, 1317 (Fed. Cir. 2000). See also In re Fine, 837 F.2d 1071, 5 USPQ2d 1596 (Fed. Cir. 1988); In re Jones, 958 F.2d 347, 21 USPQ2d 1941 (Fed. Cir. 1992).

The prior art, either alone or in combination, does not teach or suggest all the features of the independent claims, as amended on October 30, 2003. With respect to independent claim 20, Takeda, Tanaka and Harris, either alone or in combination, do not teach or suggest that hologram patterns of a hologram member are determined so that diffraction light is given an inverse aberration of an aberration to be caused by optical elements in an optical path from a real laser light source to a recording medium,

and the aberration to be caused by optical elements including an aberration occurring when the light is diffracted at the hologram member.

In conventional multi-light spot type optical pickup devices, a hologram was used only to form a plurality of light spots from a single real laser light source. In general, the multi-light spot type of optical pickup device has optical elements such as an objective lens or collimator lens to form the light spots on the recording medium. However, each of the light spots on the recording medium is likely to be subjected to an aberration to be caused by the optical elements. Thus, in the conventional multi-light spot type of optical pickup device, the diffraction grating was used only to form the plurality of light spots from the single real laser light source. However, in the present invention the hologram member is used instead of the diffraction grating, and the hologram member of the present invention not only forms the plurality of light spots from the single real laser light source, but also provides the diffraction light with an inverse aberration of the aberration to be caused by the optical elements. As a result, in the present invention, the aberration of each light spot on the recording medium can be advantageously restrained.

Takeda appears to disclose an optical pickup device which includes forming a plurality of light spots on a recording medium using a diffractive grating. In Takeda, a "holographic optical element 22 is arranged to be split into two" (column 7, lines 32-33) in order to eliminate a problem with a photodetector dead zone. However, the optical pickup device of Takeda does not reduce an aberration of a light spot to be caused by a diffraction light. Further, Takeda does not teach or suggest that hologram patterns of a hologram member are determined so that diffraction light is given an inverse aberration of an aberration to be caused by optical elements in an optical path from a real laser light source to a recording medium, and the aberration to be caused by optical elements including an aberration occurring when the light is diffracted at the hologram member.

Tanaka does not cure the deficiencies in Takeda. The Official Action asserts that Tanaka teaches that "the hologram can be [designed] to correct the aberrations

introduced by the optical system including the objective lens" (page 3, Paper No. 19). The Applicants respectfully disagree that Tanaka teaches designing a hologram to correct aberrations. Rather, Tanaka is generally concerned with a problem that results from scanning disks with different thicknesses (abstract). Tanaka solves this problem by correcting an aberration of the objective lens 2 (see, for example, claim 1 and Fig. 1). Tanaka does not teach or suggest adjusting an aberration which occurs when light is diffracted at a hologram member. Even assuming motivation to combine Takeda and Tanaka were found, at best, Tanaka might teach one of ordinary skill in the art to modify the shape of the objective lens 14 in Takeda. However, Takeda and Tanaka, either alone or in combination, do not teach or suggest that hologram patterns of a hologram member are determined so that diffraction light is given an inverse aberration of an aberration to be caused by optical elements in an optical path from a real laser light source to a recording medium, and the aberration to be caused by optical elements including an aberration occurring when the light is diffracted at the hologram member.

Further, the optical pickup device of Tanaka is fundamentally different in basic structure from the multi-light spot type of optical pickup device of the present invention. The optical pickup device of Tanaka functions to compensate for a chromatic aberration. In contrast, the present invention functions to adjust the hologram pattern in such a way that an inverse aberration of the aberration to be caused by the optical elements, which are located from the real laser light source to the recording medium, is provided to the diffraction light (see claim 1). Thus, the hologram pattern of Tanaka only fulfills a single function of obtaining an objective lens characteristic, whereas the hologram pattern of the present invention has two functions, one being a function of creating virtual light sources from the real laser light source, and the other being a function of compensating for the aberration to be caused by the other optical elements. In summary, there is nothing in Tanaka and Takeda teaching or suggesting to one skilled in the art the following technical matters:

(a) It is not a single function but at least two functions that are fulfilled by the hologram pattern.

(b) The two functions of the hologram pattern are (1) creating the virtual light sources from the real laser light source, and (2) compensating for the aberration to be caused by the other optical elements.

(c) To actually fulfill the function of compensating for the aberration to be caused by the other optical elements, the hologram pattern is established so that an inverse aberration of the aberration to be caused by the optical elements (in the optical path from the real laser light source to the recording medium) is provided to the diffraction light.

In the Applicants' specification, the following matters are described at page 2, line 24 to page 3, line 12.

Although only a single semiconductor laser can be used with the diffraction grating 64 and manufacture cost can be lowered, it is necessary to mount the diffraction grating 64 at the position as near to the semiconductor laser as possible in order to make compact the optical pickup device. In this case, as shown in Fig. 9, the nearer to the semiconductor laser the diffraction grating is mounted, the larger the angle  $\theta$  between the light beam incident upon the diffraction grating 64 from the real laser light source 11 and the diffraction light beam emitted from the diffraction grating 64 ( $\theta_1 > \theta_2$ ). Therefore, astigmatism and coma of a light spot become large, which make the diameters of lights spots 25a, 25b, and 25c larger and increase jitters in a reproduced signal. (Emphasis added.)

As seen from the above descriptions in the specification, the problem, which the present invention confronts, resides in the occurrence of an aberration due to the diffraction of light at the diffraction grating located close to the laser light source. Also, the solution of the present invention is to replace the diffraction grating with a hologram member capable of arbitrarily establishing a hologram pattern.

None of the cited prior art references recognize the above problems nor teach a solution to these problems. Therefore, the cited prior art references neither teach nor suggest a solution to the problem. Specifically, the prior art references do not teach or

suggest that hologram patterns of a hologram member are determined so that diffraction light is given an inverse aberration of an aberration to be caused by optical elements in an optical path from a real laser light source to a recording medium, and the aberration to be caused by optical elements including an aberration occurring when the light is diffracted at the hologram member.

Furthermore, there is no suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify Takeda and Tanaka or to combine reference teachings to achieve the claimed invention.

The Official Action asserts that “[it] would then have been obvious to one skilled in the art to apply the teaching of Tanaka et al to modify the holographic optical element of Takeda et al to also correct the aberrations generated by the optical system for the benefit of enhancing the quality of the light spots formed on the recording medium” (Id.). The Applicants respectfully disagree. As noted above, Tanaka might, at best, teach one of ordinary skill in the art to modify the shape of the objective lens 14 in Takeda. However, there is no motivation provided in Tanaka to modify the holographic optical element 22 in Takeda, much less modify Takeda such that hologram patterns of the holographic optical element 22 in Takeda are determined so that diffraction light is given an inverse aberration of an aberration to be caused by optical elements in an optical path from a real laser light source to a recording medium, and the aberration to be caused by optical elements including an aberration occurring when the light is diffracted at the hologram member. Therefore, the Applicants respectfully submit that there is no suggestion or motivation to modify Takeda and Tanaka or to combine reference teachings to achieve the claimed invention.

The Applicants further contend that even assuming, *arguendo*, that the combination of Takeda and Tanaka is proper, there is a lack of suggestion as to why a skilled artisan would use the proposed modifications to achieve the unobvious advantages first recognized by the Applicants. The mere fact that references can be

combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination.

In the present application, it is respectfully submitted that the prior art of record, alone or in combination, does not expressly or impliedly suggest the claimed invention and the Official Action has not presented a convincing line of reasoning as to why the artisan would have found the claimed invention to have been obvious in light of the teachings of the references.

For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Paragraph 3 of the Official Action rejects claim 21 as obvious based on the combination of Takeda, Tanaka, and U.S. Patent No. 5,422,753 to Harris. Harris does not cure the deficiencies in Takeda and Tanaka. The Official Action relies on Harris to allegedly teach the features of an undiffracted zero order, uniform intensity scanning beam 52. Harris does not teach or suggest teach or suggest that hologram patterns of a hologram member are determined so that diffraction light is given an inverse aberration of an aberration to be caused by optical elements in an optical path from a real laser light source to a recording medium, and the aberration to be caused by optical elements including an aberration occurring when the light is diffracted at the hologram member. Also, Harris does not provide a proper motivation to combine Takeda and Tanaka. For the reasons stated above, the Official Action has not formed a proper *prima facie* case of obviousness. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

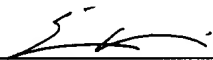
Paragraph 4 of the Official Action rejects claim 24 as obvious based on Harris. With respect to independent claim 24, the Advisory Action does not appear to address the Applicants' response at pages 8 and 9 of the *Amendment* filed October 30, 2003. For the reasons stated in the *Amendment*, the Applicants submit that Harris does not

teach or suggest that a hologram member has a hologram pattern which provides a uniform intensity of a servo light spot in a whole servo light spot area.

Since Harris does not teach or suggest all the claim limitations, a *prima facie* case of obviousness cannot be maintained. Accordingly, reconsideration and withdrawal of the rejections under 35 U.S.C. § 103(a) are in order and respectfully requested.

Should the Examiner believe that anything further would be desirable to place this application in better condition for allowance, the Examiner is invited to contact the Applicants' undersigned attorney at the telephone number listed below.

Respectfully submitted,

  
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